UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,156	10/09/2003	Mitsunori Miki	2927-0155P	6433

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EXAMINER
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ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04/06/2007</u>.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) <u>4 and 7</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-3,5,6,8 and 9</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>09 October 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 04/06/2007 have been fully considered but they are moot in view of the amendments made to the previously presented Claims 1 and 6.

2. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. "genetic algorithm on page 9 line 6-- ") are not recited in the previously rejected claim(s) 1 and 6. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3. Claim 9 is a newly added claim and was not presented previously hence the arguments in respect to the Claim are not persuasive.

4. Claims 4 and 7 are cancelled and will not be considered for further prosecution.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Ohshima et al. (US 6226416) hereafter Ohshima.

5. Regarding Claim 9, Ohshima disclose a method of measuring rotational and flight characteristics of a sphere in **(Figs 1-4,5a, 5b and 6)**, comprising the steps of: photographing said sphere **(Element 2 in Fig 1)**, at predetermined intervals, having a plurality of marks **(Q and P in Fig 3)** given to a surface thereof while said sphere is rotating to obtain a plurality of two-dimensional images of said sphere at **(Col 2 lines 44-45)**; generating an imaginary sphere, having a plurality of marks given to a surface thereof, formed at coordinates of a three-dimensional space of a computer screen **(Figs 3 and 4)**; and setting an arbitrary posture of said imaginary sphere and an arbitrary position thereof as a reference posture and a reference position respectively at **(Fig 4 and Col 3 Lines 26-48)**; deriving a relationship between three-dimensional coordinates and two-dimensional coordinates by using at least one photographing means **(Col 2 Lines 38-64 and Fig 4 and Col 3 Lines 26-48)**; converting positions of said marks given to said surface of said imaginary sphere formed at said coordinates in said three-dimensional space into positions on a two-dimensional image by using said relationship to find coordinate values of two-dimensional imaginary marks and find coordinate values of said marks present on said two-dimensional images of

said sphere**(Col 3 Lines 1-47)**; performing an operation of displacing a posture of said imaginary sphere relative to said reference posture and said reference position in such a way that said coordinate values of said two-dimensional imaginary marks and said coordinate values of said marks present on said two-dimensional images of said sphere are coincident with each other to specify a three-dimensional posture of said sphere and a three-dimensional position thereof for each of said two-dimensional images of said sphere, according to an amount of said posture displacement operation at **(Figs 3,4 and Col 3 Lines 1-47)**; and computing said rotational and flight characteristics of said sphere, according to said three-dimensional posture and position of said sphere specified for each of said two-dimensional images of said sphere at one time and said three-dimensional posture and position thereof at another time **(Fig 1 arithmetic unit 4 and Cols3-7)**. Wherein a plurality of said marks are given to a surface of said imaginary sphere, with said marks symmetrical at not more than four times **(two times as disclosed in figs 3 and 4)** with respect to a rotational axis of said sphere in an operation of rotating said imaginary sphere.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3,5-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima in view of Tanaka et al. (US 6097472) hereafter Tanaka.

6. Regarding Claim 1, Ohshima discloses a method of measuring rotational and flight characteristics of a sphere in **(Figs 1-4,5a, 5b and 6)** comprising the steps of: photographing said sphere **(Element 2 in Fig 1)**, at predetermined intervals, having a plurality of marks **(Q and P in Fig 3)** given to a surface thereof while said sphere is rotating to obtain a plurality of two-dimensional images of said sphere at **(Col 2 lines 44-45)**; generating an imaginary sphere, having a plurality of marks given to a surface thereof, formed at coordinates of a three-dimensional space of a computer screen **(Figs 3 and 4)**; and setting an arbitrary posture of said imaginary sphere and an arbitrary position thereof as a reference posture and a reference position respectively **(Fig 4 and Col 3 Lines 26-48)**; deriving a relationship between three-dimensional coordinates and two-dimensional coordinates by using at least one photographing means at **(Col 2 Lines 38-64 and Fig 4 and Col 3 Lines 26-48)**; converting positions of said marks given to said surface of said imaginary sphere formed at said coordinates in said three-dimensional space into positions on a two-dimensional image by using said relationship to find coordinate values of two-dimensional imaginary marks and find coordinate values of said marks present on said two-dimensional images of said sphere at **(Col 3 Lines 1-47)**; performing an operation of displacing a

posture of said imaginary sphere relative to said reference posture and said

reference position in such a way that said coordinate values of said two-

dimensional imaginary marks and said coordinate values of said marks present

on said two-dimensional images of said sphere are coincident with each other to

specify a three-dimensional posture of said sphere and a three-dimensional

position thereof for each of said two-dimensional images of said sphere,

according to an amount of said posture displacement operation at **(Figs 3,4 and

Col 3 Lines 1-47)**; and computing said rotational and flight characteristics of said

sphere, according to said three-dimensional posture and position of said sphere

specified for each of said two-dimensional images of said sphere at one time and

said three-dimensional posture and position thereof at another time in **(Fig 1

arithmetic unit 4 and Cols3-7)**.

Although Ohshima discloses an iterative algorithm for processing posture

displacement, however does not specifically disclose wherein said posture

displacement operation comprises an operation of moving and rotating said

imaginary sphere; and an amount of said posture displacement operation relative

to said reference posture and said reference position is found by computations

based on an optimization method called a genetic algorithm.

Tanaka discloses the wherein said posture displacement operation

comprises an operation of moving and rotating said imaginary sphere; and an

amount of said posture displacement operation relative to said reference posture

and said reference position is found by computations based on an optimization

method called a genetic algorithm at **(Col 3 Lines 36-37,Col 9 Lines 19-46, Col 13 Lines 5-67,Col 15 Lines 63-67)**. Tanaka further discloses that Kinoform of 100% efficiency can be produced by aligning the marks using the algorithms at **(Col 14 Lines 45-49)**. The method and apparatus as disclosed by Tanaka is used in alignment of marks on spherical objects therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the genetic algorithm as taught by Tanaka in the apparatus and method of Ohshima for the above reasons.

7. Regarding claim 2,Ohshima and Tanaka disclose the method according to claim 1. Ohshima further discloses wherein at least six three-dimensional coordinates are used in deriving said relationship between said three-dimensional coordinates and said two-dimensional coordinate in **(Table 1, Figs 5a - 5b, Col 5 Lines 39-67, Col 6 Lines 1-67 and Col 7 Lines 1-11)**.

8. Regarding Claim 3, Ohshima and Tanaka disclose the method according to claim 1. Ohshima further disclose wherein as design six variables to be used in said posture displacement operation, three-dimensional positions of a center of gravity of said imaginary sphere and rotation angles thereof on rectangular coordinates consisting of an abscissa axis, an ordinate axis, and a vertical axis in a imaginary three-dimensional space **(Table 1, Figs 5a - 5b, Col 5 Lines 39-67, Col 6 Lines 1-67 and Col 7 Lines 1-11)**.

9. Regarding Claim 5,Ohshima and Tanaka disclose the method according to claim 1. Ohshima further disclose wherein a plurality of said marks are given to a surface of said imaginary sphere, with said marks symmetrical at not more than four times with respect to a rotational axis of said sphere in an operation of rotating said imaginary sphere in **(Figs 3,4,5a and 5b)**.

10. Claim 6 is a corresponding apparatus claim of a method of claim 1. See the explanation of Claim 1.

11. Regarding Claim 8, Ohshima and Tanaka disclose an apparatus according to claim 6. Ohshima further disclose wherein said photographing means has a construction capable of photographing a sphere rotating or moving at a plurality of times at predetermined intervals **(Col 2 Lines 23-43 and Col 7 Lines 10-22)**.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a

first reply is filed within TWO MONTHS of the mailing date of this final action and

the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the

date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In

no event, however, will the statutory period for reply expire later than SIX

MONTHS from the date of this final action. Any inquiry concerning this

communication or earlier communications from the examiner should be directed

to Jayesh A. Patel whose telephone number is 571-270-1227. The examiner can

normally be reached on M-F 7.00am to 4.30 pm (5-4-9). If attempts to reach the

examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu

can be reached on 571-272-7429. The fax phone number for the organization

where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

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free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

Jayesh Patel
05/20/07 $\mathcal{JP}$

JINGGE WU
(SUPERVISORY PATENT EXAMINER